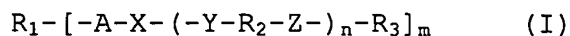
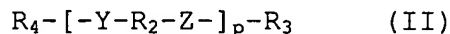


CLAIMS

1. A fire-resistant composition comprising at least:  
 a) a star polyamide-based polyamide matrix comprising  
 5 at least macromolecular chains of formula (I):



and optionally macromolecular chains of formula  
 10 (II):



in which:

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- Y is the radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  when X and Z represent the  
 radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  ;

- Y is the radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  when X and Z represent the  
 radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  ;

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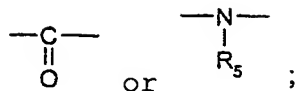
- A is a covalent bond or an aliphatic hydrocarbon-based radical possibly comprising hetero atoms and comprising from 1 to 20 carbon atoms;

- R<sub>1</sub> is a linear or cyclic, aromatic or aliphatic hydrocarbon-based radical comprising at least 2  
 25 carbon atoms, and possibly comprising hetero atoms;

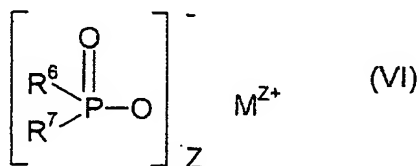
- R<sub>2</sub> is an aliphatic or aromatic, branched or unbranched hydrocarbon-based radical comprising from 2 to 20 carbon atoms;

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- R<sub>3</sub> and R<sub>4</sub> independently represent hydrogen, an -OH radical and/or a hydrocarbon-based radical comprising at least one group:



- R<sub>5</sub> represents hydrogen or a hydrocarbon-based radical especially comprising from 1 to 6 carbon atoms;
- 5    - m represents an integer between 3 and 8;
- n represents an integer between 50 and 200; and
- p represents an integer between 50 and 200; and
- b)    a fire-resistant composition comprising at least;
- 10    - a compound (F1) of formula (VI):



in which:

- R<sub>6</sub> and R<sub>7</sub> are identical or different and represent a linear or branched alkyl chain comprising from 1 to 6 carbon atoms and/or an aryl radical;
- 15    - M represents a calcium, magnesium, aluminum and/or zinc ion;
- Z represents 2 or 3; and
- a compound (F2), which is a product of reaction between phosphoric acid and melamine and/or a product of reaction between phosphoric acid and a condensed melamine product.
- 20

2. The composition as claimed in claim 1, comprising from 30% to 99% by weight of star polyamide relative to the total weight of the composition.

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3. The composition as claimed in claim 1 or 2, comprising from 1% to 70% by weight of the fire-resistant system relative to the total weight of the composition.

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4. The composition as claimed in any one of claims 1 to 3, characterized in that the radical R<sub>1</sub> is a radical

chosen from the cycloaliphatic, arylaliphatic and linear aliphatic group, the mass ratio between the weight of polymer chains of formula (I) and the total weight of polymer chains of formulae (I) and (II) being  
5 between 0.10 and 1.

5. The composition as claimed in any one of claims 1 to 3, characterized in that the radical  $R_1$  is an aromatic radical, the mass ratio between the weight of  
10 polymer chains of formula (I) and the total weight of polymer chains of formulae (I) and (II) being less than 1 and preferably less than 0.9.

6. The composition as claimed in any one of claims 1  
15 to 5, characterized in that  $R_2$  is a pentamethylene radical.

7. The composition as claimed in any one of claims 1 to 6, characterized in that  $R_1$  represents a radical  
20 chosen from the cyclohexanonetetracyl radical, the 1,1,1-triylpropane radical, the 1,2,3-triylpropane  
radical and the radical:  
$$\begin{array}{c} >N-CH_2-H_2C-N< \\ & \quad \quad \quad \cdot \end{array}$$

8. The composition as claimed in any one of claims 1  
25 to 7, characterized in that A represents a radical chosen from the methylene, polymethylene and polyoxyalkylene radical.

9. The composition as claimed in any one of claims 1  
30 to 8, characterized in that the phosphinic acid of compound F1 may be chosen from the group consisting of dimethylphosphinic acid, ethylmethylphosphinic acid, diethylphosphinic acid and methyl-n-propylphosphinic acid, or a mixture thereof.

35  
10. The composition as claimed in any one of claims 1 to 9, characterized in that the compound F2 may be chosen from the group consisting of melamine

polyphosphate, melam polyphosphate and melem polyphosphate, or a mixture thereof.

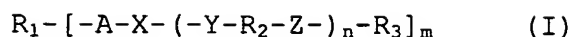
11. The composition as claimed in any one of claims 1 to 10, characterized in that it comprises from 0 to 80% by weight of reinforcing fillers relative to the total weight of the composition.

12. The composition as claimed in any one of claims 1 to 11, characterized in that said composition comprises reinforcing fillers chosen from the group comprising: glass fibers, carbon fibers, mineral fibers, ceramic fibers, heat-resistant organic fibers, for instance polyphthalamide fibers, and mineral fillers such as wollastonite, kaolin, clay, silica and mica, and mineral nanofillers such as montmorillonite and  $\alpha$ -Zr phosphate, or a mixture thereof.

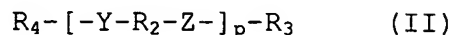
13. The composition as claimed in any one of claims 1 to 12, characterized in that said composition comprises fire-resistant agents or fire-resistant-system synergists chosen from the group comprising inorganic compounds and/or mineral products chosen from: zeolites, ceramic powder, magnesium hydroxide, hydrotalcites, magnesium carbonates and other alkaline-earth metal carbonates, zinc oxide, zinc stannate, zinc hydroxystannate, zinc phosphate, zinc borate, zinc sulfide, aluminum hydroxide, aluminum phosphate and red phosphorus, organonitrogen compounds belonging to the triazine class, such as melamine or derivatives thereof, for instance melamine cyanurate, melamine phosphates, polyphosphates and pyrophosphates and organophosphorous acids and salts thereof.

14. A process for manufacturing a fire-resistant composition, in which at least the following are mixed together:

a) a star polyamide-based polyamide matrix comprising at least macromolecular chains of formula (I):



and optionally macromolecular chains of formula  
(II):



in which:

10

- Y is the radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  when X and Z represent the  
radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  ;

- Y is the radical:  $\begin{array}{c} \text{---C---} \\ || \\ O \end{array}$  when X and Z represent the  
radical:  $\begin{array}{c} \text{---N---} \\ | \\ R_5 \end{array}$  ;

15

- A is a covalent bond or an aliphatic hydrocarbon-based radical possibly comprising hetero atoms and comprising from 1 to 20 carbon atoms;

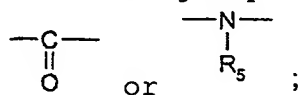
-  $R_1$  is a linear or cyclic, aromatic or aliphatic hydrocarbon-based radical comprising at least 2 carbon atoms and possibly comprising hetero atoms;

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-  $R_2$  is an aliphatic or aromatic, branched or unbranched hydrocarbon-based radical comprising from 2 to 20 carbon atoms;

-  $R_3$  and  $R_4$  independently represent hydrogen, an -OH radical and/or a hydrocarbon-based radical comprising at least one group:

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-  $R_5$  represents hydrogen or a hydrocarbon-based radical comprising from 1 to 6 carbon atoms;

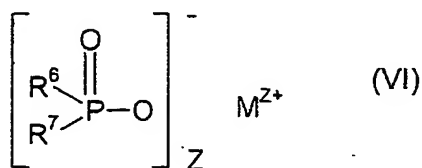
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- m represents an integer between 3 and 8;

- n represents an integer between 50 and 200;

- p represents an integer between 50 and 200; and

- b) a fire-resistant composition comprising at least:  
- a compound (F1) of formula (VI):



in which:

- 5    -     $\text{R}_6$  and  $\text{R}_7$  are identical or different and represent  
a linear or branched alkyl chain comprising from 1  
to 6 carbon atoms and/or an aryl radical;  
-     $\text{M}$  represents a calcium, magnesium, aluminum and/or  
zinc ion;  
10   -     $\text{Z}$  represents 2 or 3; and  
-    a compound (F2), which is a product of reaction  
between phosphoric acid and melamine and/or a  
product of reaction between phosphoric acid and a  
condensed melamine product.  
15  
15. A process for manufacturing an article by forming  
a composition as claimed in any one of claims 1 to 13,  
via a process chosen from the group comprising an  
extrusion process, a molding process, an injection  
20 process and a spinning process.  
16. An article obtained by forming a composition as  
claimed in any one of claims 1 to 13.